19. (a) How the orientation of substituents influences the *o/p* ratio and reactivity of monosubstituted benzenes? (5)

(b) Why reaction of sodium methoxide with *ortho* and pura isomer of fluoronitro benzene is faster as compared with *m*-fluoronitrobenzene? (5)

20. (a) Discuss various kinds of non-kinetic evidence employed for determining mechanism of organic reaction. (5)

(b) Establish the connection between Hammett substituent constant and *pKa* using an example. (5)

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APRIL/MAY 2024

DCH11/GCH11 — ORGANIC CHEMISTRY – I

Time : Three hours Maximum : 75 marks

Shanmuga Industries Arts & Science College T.V.Malai

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is meant by meso isomer? Given an example with a proper structure.
2. Define homotopic face with a suitable example.
3. Why trans-4-t-butylcyclohexanol undergo acylation faster than the cis-isomer?
4. Why is decalin exists in cis and trans form?
5. Why bromination of tert-butyl alcohol is much faster than n-butanol?
6. Give an example for S_E^i reaction.
7. How can you convert phenol into salicylic acid?
8. What is meant by Ziegler alkylation?
9. Give an example for isotopic labelling.
10. Define partial rate factor with an example.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Discuss the stereoisomerism in biphenyl and allene structures.

Or

(b) What is meant by stereospecific synthesis? Explain with suitable examples.

12. (a) Why do cis and trans-2-chlorocyclohexanols behave differently when treated with alkali?

Or

(b) Explain the stereochemistry and conformation of 9-methyl decalin.

13. (a) How the orientation of substituents influences the o/p ratio and reactivity of monosubstituted benzenes?

Or

(b) Explain the claisen and Dieckmann Condensation reaction.

14. (a) Explain the synthesis of 3-nitro-4-bromobenzole acid and 1,3,5-trimethyl benzene from benzene.

Or

(b) Discuss the synthetic applications of benzyne intermediate.

15. (a) Write briefly about the thermodynamic requirements for an organic reaction.

Or

(b) Discuss the features and limitations of both Hammett and Taft equation.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. (a) How to assign R and S configuration for substituted biphenyl and allene system. (5)

(b) Explain various kinds of topicities with suitable examples. (5)

17. (a) In cyclohexyl system, axial secondary alcohols are oxidised by chromic acid at a faster rate compared to secondary equatorial alcohols. Justify the statement. (5)

(b) Explain Comment on the topic relationship between the two faces of carbonyl group of 4-1-butyl cyclohexanone. (5)

18. (a) Discuss plausible mechanism involved in Von-Braun reaction and Claisen condensation. (5)

(b) Explain the merits of Stork enamine reaction with suitable examples. (5)